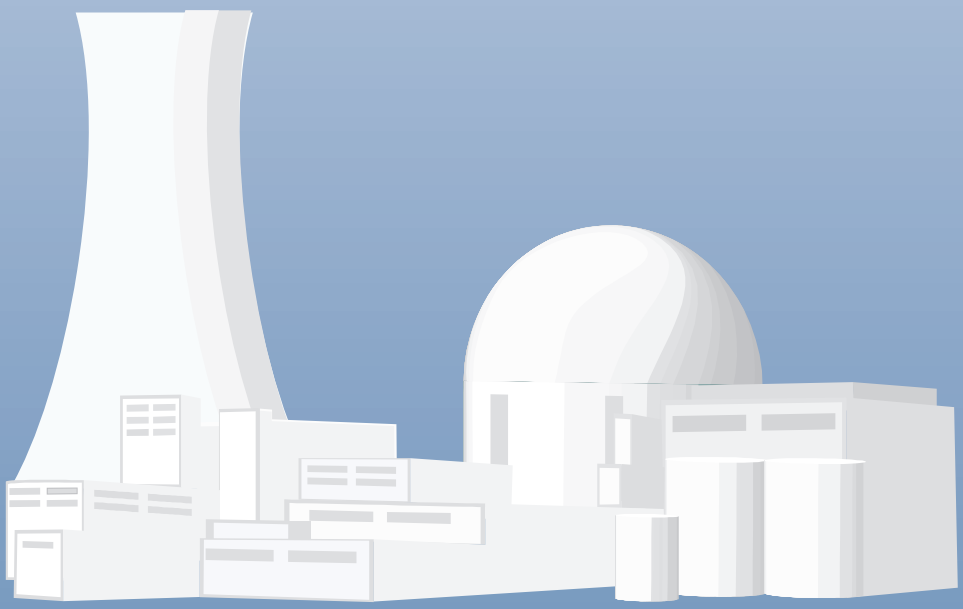
ACRS

2001 Action Plan

Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission



The Advisory Committee on Reactor Safeguards (ACRS) was established as a statutory committee of the Atomic Energy Commission (AEC) by a 1957 amendment to the *Atomic Energy Act* of 1954. The functions of the Committee are described in Sections 29 and 182b of the Act. The *Energy Reorganization Act* of 1974 transferred the AEC's licensing functions to the U.S. Nuclear Regulatory Commission (NRC), and the Committee has continued serving the same advisory role to the NRC.

The ACRS reports directly to the Commission, providing independent reviews of, and advice on, the safety of proposed or existing NRC-licensed reactor facilities and the adequacy of proposed safety standards. The ACRS reviews power reactor and fuel cycle facility license applications for which the NRC is responsible, as well as the safety-significant NRC regulations and guidance related to these facilities. On its own initiative, the ACRS may review certain generic matters or safety-significant nuclear facility items. The Committee also advises the Commission on safety-significant policy issues, and performs other duties as the Commission may request. Upon request from the U.S. Department of Energy (DOE), the ACRS provides advice on U.S. Naval reactor designs and hazards associated with the DOE's nuclear activities and facilities. In addition, upon request, the ACRS provides technical advice to the Defense Nuclear Facilities Safety Board.

ACRS operations are governed by the *Federal Advisory Committee Act* (FACA), which is implemented through NRC regulations at Title 10, Part 7, of the *Code of Federal Regulations* (10 CFR Part 7). ACRS operational practices encourage the public, industry, state and local governments, and other stakeholders to become involved in Committee activities.

The Advisory Committee on Reactor Safeguards 2001 Action Plan, Priorities, and Activities

This plan provides guidance and direction for the Advisory Committee on Reactor Safeguards (ACRS) for the year 2001 and beyond to focus the Committee on the issues that are most important to the U.S. Nuclear Regulatory Commission (NRC) in carrying out its mission to protect public health and safety, promote the common defense and security, and protect the environment. It also defines the mission, goals, objectives, and priorities of the ACRS, consistent with the NRC's Strategic Plan. In addition, this plan provides ACRS clients and stakeholders with information regarding planned ACRS reviews and activities, as well as the criteria that the ACRS uses to select issues for review.

SCOPE OF ACRS ACTIVITIES

The Committee reports to and advises the Commission on technical matters related to nuclear reactor safety and safeguards. The bases of ACRS reviews include Title 10 of the *Code of Federal Regulations* (10 CFR), Parts 20, 21, 26, 50, 51, 52, 54, 55, 70, 72, 73, 76, and 100, as well as other applicable legislation and regulations. Current regulatory activities that are within the scope of ACRS responsibilities include license renewal, application of risk-informed and performance-based regulations, reactor operations, rulemaking, codes and standards, generic safety issues, research, and other regulatory issues as requested by the Commission. To fulfill its responsibilities, the ACRS provides a forum for the discussion of technical safety issues by all affected parties, including the NRC staff; the interested public; the U.S. Department of Energy (DOE); the NRC's Advisory Committee on Nuclear Waste (ACNW); other Federal agencies; state, tribal, and local governments; and private, international, and other organizations, as appropriate.

ACRS MISSION

The mission of the ACRS is to provide the Commission with independent and timely technical advice on issues of public safety related to nuclear reactors and reactor safeguards. In so doing, the ACRS supports the NRC in conducting an efficient regulatory program that enables the Nation to safely use nuclear power for civilian purposes.

ACRS VISION

The ACRS envisages safety regulation of nuclear power plants on the basis of a coherent set of requirements that are securely founded on science, engineering, and quantitative risk assessment.

ACRS OPERATING PRINCIPLES

The ACRS ensures that the priorities of the Commission and its Executive Director for Operations (EDO) are understood and adequately considered in setting the Committee's agenda. It makes its letters and reports clear and concise. The ACRS continues to believe that early involvement is, on balance, the best approach for resolving complex issues, and that it allows the ACRS to provide input when it is most efficient and effective. The ACRS also believes that the Committee is most effective when it involves itself in the resolution of broad technical issues. The Committee will continue to maintain its independence as it reviews issues.

OUTCOMES AND COMMITMENTS

The Committee aspires to achieve the following outcomes:

1. Provide useful advice in adequate time for consideration by the Commission in making regulatory decisions.

2. Alert the Commission to potential challenges that may be averted by taking interim action.

3. Forewarn the Commission regarding emerging issues that may require action at a later time.

4. Ensure that the Committee's advice reflects state-of-the-art technology; is practical; and allows for incorporation into the NRC's technical approaches, regulations, and guidance.

5. Ensure that the Committee's advice reflects an understanding of inherent risks, and considers first the need for adequate protection and, secondly, the need to balance risk, cost, and benefit in all of the NRC's decisions.

6. Provide advice that is valued by the Commission, the NRC staff, the DOE, and the public.

7. Earn the public's trust by providing frank, open advice, and by offering a forum for public participation in the regulatory process.

8. Assist in resolving conflicts between the NRC and other stakeholders by encouraging communication and providing a neutral forum for interaction.

To accomplish its mission, the Committee will carry out the following commitments:

1. Focus on nuclear safety.

2. Be responsive to the Commission's needs.

3. Maintain technical excellence.

4. Foster an atmosphere of mutual problem solving with the NRC staff.

5. Remain unbiased, be responsive to change, and consider various options and contingencies.

6. Identify, in advance, those issues that could impact the NRC's ability to achieve its mission.

7. Focus on risk by asking what is the risk, what are the important contributors to risk, and what are the uncertainties associated with the risk.

8. Keep abreast of international trends and developments that could affect the NRC's regulatory practices or approaches, and factor international experience into the Committee's advice, where appropriate.

GOALS AND OBJECTIVES

In keeping with its mission, the ACRS has developed the following goals and objectives, which are consistent with the performance goals in the NRC's Strategic Plan, and reflect current regulatory needs:

Goal 1 **Provide useful advice to support the Commission in responding to the evolution of and challenges to the safe use of nuclear power.**

Objective 1 *Advise the Commission in a timely fashion on issues of a technical nature that may impact public health and safety and protection of the environment in the following areas:*

- *implementation of risk-informed and performance-based, safety regulations*
- *the reactor oversight process*
- *safety issues related to age-related degradation*
- *research efforts that provide the technical bases for the NRC's regulatory decisions*
- *safety issues associated with new nuclear designs*
- *changes in the nuclear industry*
- *prioritization and resolution of generic safety issues (GSIs)*
- *rulemaking and regulatory guidance*

Goal 2 **Support the NRC in building and maintaining public trust by involving the public in the ACRS' process of reviewing nuclear power safety and safeguards issues.**

Objective 1	*Provide opportunities for meaningful public involvement in the regulatory process by implementing the Federal Advisory Committee Act (FACA) and by fostering an open, accessible, and clear, yet independent review process.*
Objective 2	*Assist the NRC in ensuring that agency decision making is a transparent process by noting whether agency documentation reviewed by the Committee is thorough, clear, and readily understandable.*
Goal 3	**Support the effectiveness and efficiency of NRC operations.**
Objective 1	*Advise the NRC on how to increase its reliance on risk insights as a basis for decision making, including using risk assessment methods for the safe use of nuclear power, that (1) implements a risk-informed approach, (2) quantifies and reveals uncertainties, and (3) is consistent across programs, where possible.*
Objective 2	*Propose approaches that provide a better understanding of the inherent risks associated with nuclear power and the relationships between safety, regulations, and cost.*
Objective 3	*Provide technically sound and realistic approaches for resolving new and emerging issues related to the safe operation of nuclear power plants.*
Goal 4	**Support the NRC's use of good science in resolving key safety issues in an effort to reduce unnecessary regulatory burden on stakeholders.**
Objective 1	*Keep abreast of the challenges associated with changing regulatory demands, as well as the new technologies that are being developed and utilized throughout the world.*
Objective 2	*Recommend ways to utilize risk-informed and performance-based approaches to reduce unnecessary burden.*
Objective 3	*Advise the Commission on the effectiveness of the reactor oversight process, with respect to the safety of nuclear power plant operations.*
Objective 4	*Advise the Commission of projected needs for additional NRC technical capabilities that could enhance the agency's ability to effectively address safety issues.*
Goal 5	**Improve the effectiveness and efficiency of ACRS operations.**
Objective 1	*Seek opportunities to increase the value of ACRS advice to the Commission and the NRC staff.*

Objective 2 *Maintain innovative and sound business practices that focus on outcomes, and provide effective tools for establishing goals.*

Objective 3 *Improve and modify operational procedures for reporting on program accomplishments and matters of accountability.*

Objective 4 *Enhance the effectiveness of the review process by building upon mutually beneficial relationships with the NRC staff and stakeholders.*

CRITERIA FOR SELECTING PRIORITY ISSUES

The following criteria are used to identify the priority of issues that the ACRS reviews:

- Does the issue have an immediate impact on nuclear safety?
- Is the issue required by law or regulations?
- Is the issue risk-significant, or does it affect adequate protection of health and safety?
- Are there potential long-term issues requiring continuous attention by the agency?
- Is the issue requested by the Commission?
- Is the issue requested by the EDO?
- Was the issue raised by the public?
- Did the ACRS initiate the review of an issue that may or may not currently be worked on by the NRC staff?

PRIORITY ISSUES

A list of ACRS priority issues is provided below. This list will be augmented, as necessary, to support the changing needs of the agency and to deal with significant emerging technical and safety issues.

License Renewal

10 CFR 54.25 requires that each license renewal application be referred to the ACRS for a review and report. An ACRS review is essential, given the potential safety implications of extending power operation of a significant number of plants for 20 years beyond their current licensed terms. ACRS involvement is also important because Congressional and industry interests have made license renewal a high-priority item for the Commission. This places significant pressure on the NRC staff to expedite the

review process, and to reduce demonstration and documentation requirements at the very time that the interpretation of the License Renewal Rule and detailed requirements and guidance for future applications are being finalized. The ACRS has been asked to review the improved guidance, and will continue to monitor the implementation of the guidance on individual renewal applications. ACRS involvement will help in the ongoing development of a standardized license renewal process. The ACRS will play a valuable role by assuming the following responsibilities:

- Participate in the development of a standardized license renewal process to ensure that detailed requirements for license renewal applications are sufficient to provide reasonable assurance that plants will operate safely throughout the period of extended operation.

- Identify significant issues, and focus attention on the ways that these issues are addressed in individual applications.

- Provide to the Commission independent views on contested interpretations of the rule, such as the issue of credit for existing programs.

- Identify ways that risk information could be used to improve the license renewal process.

- Identify issues, as appropriate, that may be outside the narrow confines of the License Renewal Rule, such as using risk information to further improve the license renewal process.

The ACRS has performed thorough reviews of the license renewal applications for Calvert Cliffs Nuclear Power Plant Units 1 and 2 and Oconee Nuclear Station Units 1, 2, and 3, and has provided timely advice to the Commission.

The ACRS will continue to play a significant role in the license renewal area through the following activities:

- Review each license renewal application.

- Review license renewal guidance documents (e.g., the NRC's Standard Review Plan, Regulatory Guides, Generic Aging Lessons Learned (GALL) Report, and the "Industry Guidelines for Implementing the Requirements of the License Renewal Rule" (NEI 95-10) promulgated by the Nuclear Energy Institute).

- Review selected industry topical reports.

- Visit plants, as needed and as resources permit, to gather information regarding the changes made to the maintenance programs and inspection practices to support extended plant operation, adequacy of the aging management programs, and other significant activities related to license renewal.

- Hold meetings to provide a forum for public participation.

- Implement an efficient process to ensure timely completion of the ACRS review of license renewal applications and related matters.

Risk-Informed and Performance-Based Regulation

The ACRS has been a strong advocate of the Agency's move toward establishing a risk-informed and performance-based regulatory system. On numerous occasions in the past, the ACRS encouraged the use of risk information in the regulatory decision-making process, and provided comments and recommendations regarding the consistent use of probabilistic risk assessment (PRA), the impact of PRA results and insights on the regulatory system, and the coherence of the regulatory process. The ACRS has also played a major role in assisting the NRC staff and providing valuable advice to the Commission for developing a risk-informed and performance-based regulatory approach. The ACRS has made significant contributions in this area, including the following:

- performed a participatory review and assisted the staff in developing several regulatory guides, especially Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Current Licensing Basis," and the associated Standard Review Plan, Chapter 19, "General Guidance" (these documents provide the foundation for a risk-informed regulatory philosophy that can better focus resources and lead to a more coherent regulatory structure)

- identified impediments to the increased use of risk-informed regulation

- commented on the role of defense-in-depth in a risk-informed regulatory system

- addressed the treatment of uncertainties versus point values in the risk-informed decision-making process

- evaluated the importance measures that are being contemplated for risk-informing 10 CFR Part 50

- commented on the use of defense-in-depth in risk-informing the activities of the NRC's Office of Nuclear Material Safety and Safeguards (NMSS)

- commented on the NEI proposal for risk-informing 10 CFR Part 50

- addressed the industry and staff activities associated with PRA quality

- commented on the proposed Options 1–3 pertaining to the development of a risk-informed regulatory approach

- reviewed the proposed risk-informed revisions to 10 CFR 50.44, regarding combustible gas control systems (Option 3)

- advised the Commission on the need to better understand the risks associated with low-power and shutdown operations

The ACRS will continue to add value to the development of a risk-informed and performance-based regulatory structure. To do so, the Committee will review and provide timely advice to the Commission on the activities associated with the risk-informed and performance-based regulatory system, including the following:

- proposed NRC framework document for risk-informing 10 CFR Part 50 (Option 3)

- proposed final risk-informed revisions to 10 CFR 50.44, regarding combustible gas control systems, and 10 CFR 50.46 regarding emergency core cooling system requirements (Option 3)

- proposed 10 CFR 50.69 and Appendix T (Option 2), associated with special treatment requirements

- proposed American Society of Mechanical Engineers (ASME), National Fire Protection Association (NFPA) 805, and American Nuclear Society (ANS) standards for PRA quality, as well as the proposed industry PRA certification process

- proposed adequate implementation of regulatory guidance documents associated with risk-informed regulation, and assessed the need for potential revisions to these documents

- proposed risk-informed performance indicators

Rules and Regulatory Guidance

10 CFR 2.809 states that when a rule involving nuclear safety matters within the purview of the ACRS is under development by the NRC staff, the staff will ensure that the ACRS is given an opportunity to provide advice at appropriate stages and to identify issues to be considered during rulemaking hearings. A memorandum of understanding between the ACRS and the EDO delineates the procedures for ACRS participation in the development of rules and regulatory guidance documents [e.g., Regulatory Guides, Standard Review Plans, and Regulatory Issue Summary Reports (Generic Letters)]. The ACRS has made significant contributions in assisting the staff in formulating and/or revising numerous rules and regulatory guidance documents.

Since its inception, the ACRS has reviewed all safety-significant rules and regulatory guidance documents that are within its purview, including the General Design Criteria. Recently, the ACRS played a major role in assisting the staff in developing or revising several important rules and regulatory guidance documents, including the following:

- proposed amendment to 10 CFR 50.55a, “Codes and Standards,” regarding elimination of the requirement to update inservice inspection and inservice testing programs every 120 months

- proposed rule, regulatory guide, and Standard Review Plan section associated with the use of an alternative source term at operating reactors

- proposed revision to 10 CFR 50.59, “Changes, Tests, and Experiments”

- proposed final revision to 10 CFR 50.65, “Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants”

- proposed rulemaking for shutdown and fuel storage pool operations at nuclear power plants

- proposed revisions to 10 CFR Parts 50 and 100, and proposed regulatory guide related to reactor siting criteria

- proposed revision of Appendix K to 10 CFR Part 50

- regulatory effectiveness of the Station Blackout Rule

- proposed rule and regulatory guide for fracture toughness requirements for light-water reactor (LWR) pressure vessels

- proposed rulemaking for reporting reliability and availability information for risk-significant systems and equipment

The ACRS will continue to review and comment on proposed rules and regulatory guidance documents, as well as revisions to existing rules and guidance documents, including those associated with a risk-informed and performance-based regulatory structure.

Safety Research Program

In a Staff Requirements Memorandum dated September 9, 1997, the Commission requested that the ACRS provide an annual report to the Commission regarding the NRC’s Safety Research Program, documenting its views on the need, scope, and balance of the research program; whether the research program provides the needed information to the research user offices; anticipation of research needs; and prioritization and planning of research in the changing regulatory and technological environment. Since receiving the Commission’s request in 1997, the ACRS has provided three reports (NUREG-1635, Volumes 1, 2, and 3, “Review and Evaluation of the Nuclear Regulatory Commission Safety Research Program”), which included valuable advice to the Commission and the staff, as follows:

- NUREG-1635, Vol. 1, dated July 1998, only included ACRS comments and recommendations resulting from the Committee’s comprehensive review of the

NRC's Safety Research Program. It included ACRS comments and recommendations on engineering the reactor safety research program, as well as several specific research activities, including those related to PRA, human factors, fire protection, severe accidents, containment integrity, thermal hydraulics, advanced instrumentation and control, reactor fuels, reactor pressure vessel integrity, and plant aging. The NRC's Office of Nuclear Regulatory Research (RES) was generally responsive to the ACRS' comments and recommendations.

- In NUREG-1635, Vol. 2, dated July 1999, the ACRS provided additional comments and recommendations on significant research activities addressed in NUREG-1635, Vol. 1. This volume emphasized the need to develop PRA models in the areas of severe accidents, human factors, fire protection, low-power and shutdown operations, and instrumentation and control systems. Also, the ACRS addressed the need for maintaining an in-house capability for independent verification of regulatory criteria and resolution of complex technical issues associated with the integrity of reactor vessel and steam generator tubes. The Committee also reiterated the need for a strong research program to support the transition to a risk-informed and performance-based regulatory structure. In general, the RES agreed to consider the ACRS' comments and recommendations.

- In NUREG-1635, Vol. 3, dated March 2000, the ACRS examined the internal and external contexts that together determine the needs for research and the corresponding responses of the agency. The ACRS also discussed how the NRC's research has evolved, and how it may develop in the future. In addition, the Committee presented specific evaluations of research requirements in response to more significant future issues. The Committee's comments and recommendations were very well received by the Commission and the RES.

In the ensuing report, to be published as NUREG-1635, Vol. 4, the Committee plans to evaluate the ongoing and proposed research activities. Specifically, the Committee will provide comments and recommendations on the continuing need for research in certain areas, whether certain research could or should be done by the industry, and whether the NRC could enhance efforts to use information developed through cooperative international research activities instead of performing research in certain areas. Also, the ACRS will attempt to identify long-range NRC research needs.

The ACRS also plans to continue reviewing the ongoing and proposed research activities as part of its annual reports, in which the Committee will provide comments and recommendations to the Commission on how well the RES program is addressing the agency's needs. Also, the ACRS plans to look at the in-house capability to perform research, and to provide views on the ability of the RES to plan and carry out the long-range research program. In addition, the ACRS intends to interact with similar advisory committees of other countries, as appropriate and as resources permit, to remain well informed of the developments in the international research arena, and to bring those developments to the attention of the Commission, as needed.

Generic Safety Issues

The ACRS has had a long-standing role in advising the Commission on the staff's prioritization and resolution of GSIs. For several years, the ACRS maintained a separate list of the GSIs that the Committee identified during its review of significant operating events and applications for construction permits and operating licenses. Recognizing the additional burden on the staff in keeping track of the GSIs identified by the ACRS and those identified by the staff, the ACRS and the NRC agreed in the early 1980s to combine the ACRS list of the GSIs with the list compiled by the NRC staff.

The ACRS made significant contributions to the GSI process, including the following:

- played a major role in assisting the staff in developing the methodology for prioritizing GSIs, which is included in NUREG-0933, "A Prioritization of Generic Safety Issues"

- reviewed the adequacy of the priority rankings (HIGH, MEDIUM, LOW, and DROP) for more than 800 GSIs (in most cases where the ACRS disagreed, the staff reassessed the priority rankings and resolved the ACRS concerns)

- reviewed the resolution of essentially all of the unresolved safety issues (USIs) and most of the GSIs (the staff resolved the ACRS concerns and disagreements regarding the adequacy of the resolution through additional and/or improved analyses which, in turn, resulted in a technically sound resolution)

- pushed for the resolution of several GSIs that were prioritized about 15 years ago, but still remained unresolved (subsequently, schedules for resolving these GSIs have been included in the Chairman's Tasking Memorandum, which is now submitted to Congress every year and, since the ACRS expressed its concern, several of these GSIs have been resolved, and the GSI process has been revised)

The ACRS will continue to add value to the GSI process by reviewing the following aspects:

- adequacy of the proposed priority rankings and resolution of GSIs

- effectiveness of using Management Directive 6.4 and the associated Handbook to implement the revised GSI resolution process

- validity of the assumptions and analyses used in prioritizing and resolving GSIs

- operational events (to determine whether they warrant reassessment of those GSIs that were previously assigned a "LOW" priority ranking and those that were classified as "RESOLVED")

- adequacy of the resolution of certain GSIs by the licensees through programs involving individual plant examination (IPE) and individual plant examination of external events (IPEEE)

- adequacy of the resolution of the GSIs identified by the Multiple System Responses Program (MSRP)

- effectiveness of the revised GSI process

Reactor Operations

The ACRS has made significant contributions in the area of reactor operations by reviewing safety-significant issues associated with operating plants and several other related matters, including the following:

- reactor oversight process (ROP), including its initial implementation

- proposed improvements to the inspection and assessment programs, generic communication process, and enforcement policy

- differing professional opinion (DPO) issues associated with steam generator tube integrity

- steam generator tube and reactor pressure vessel integrity and steam generator tube repair limits

- spent fuel pool accident risk

- insights gained from risk-informed pilot applications, including those from pilots for inservice inspection (ISI), extension of allowed outage times, and online maintenance

- strainer blockage in boiling-water reactors (BWRs)

- reliability of emergency ac power at nuclear power plants

- IPE and IPEEE programs

- physical security requirements

- lessons learned from the investigation of significant operating events (e.g., steam generator tube rupture event and reactor trip and loss of offsite power event at Indian Point Unit 2, and reactor trip event at Hatch Nuclear Plant)

- power uprates for the Fermi, Hatch, and Monticello nuclear plants

- highlights of events that occurred at foreign nuclear plants and their associated safety significance

- loss of spent fuel cooling following a loss-of-coolant accident at the Susquehanna Nuclear Plant

The ACRS will continue to make significant contributions to the safe operation of nuclear plants. To do so, the Committee plans to review several matters in this area, including the following, and provide valuable and timely advice to the Commission:

- use of performance indicators (PIs) in the ROP (to ensure that they provide meaningful insight into aspects of plant operation that are important to safety)
- initial implementation of the Significance Determination Processes (SDPs), and its technical adequacy relative to these processes
- significant operating events
- issues that led to the shutdown of plants for more than a year, and the associated corrective action programs
- strainer blockage in pressurized-water reactors (PWRs)
- risk-based analysis of reactor operating experience and risk-based technical specifications
- pressurized thermal shock (PTS) screening criteria (reevaluation)
- power uprates and applications for extended power uprates of more than 5 percent (e.g., Duane Arnold, Dresden/Quad Cities, and Clinton)
- impact of deregulation on operating plant safety
- synergisms among changes in nuclear plants (high-burnup fuel, power uprates, plant life extension, and use of "best-estimate" or "more-realistic" analyses), and their potential impact on plant safety

In addition, each year, the ACRS will visit one of the NRC's Regional Offices and a plant in that region, and will meet with the licensee and the regional staff to obtain information regarding significant issues that are currently being dealt with. Insights gained from these meetings will be used in the Committee's review of significant regulatory issues, or brought to the attention of the EDO or the Commission.

Transient and Accident Analysis Codes

Computer codes have become the major tools used to calculate reactor system behavior during transients and accidents. The codes in use have an ancestry that dates back some 30 years, and a corresponding development process that has not been transparent.

As such, the codes must be carefully compared to relevant experimental data, and used only within the range of applicability of that data. Given the above, ACRS review of these codes is necessary for the following reasons:

- The move to risk-informed regulation will result in the use of more realistic codes. Use of such codes requires a quantitative evaluation of model uncertainties, and the development of acceptance criteria.

- Code documentation must be acceptable to knowledgeable, impartial observers. Review of codes to date indicates that documentation needs to be improved. In addition, code quality must be adequate to support regulatory decisions and increase public confidence.

The ACRS has significant interest in the transient and accident analysis codes. As a result, the Committee has made major contributions in this area by providing formal and informal comments and recommendations, as follows:

- reviewed several thermal-hydraulic codes and severe accident codes used by the NRC and/or its contractors (such as RELAP5, TRAC, SCDAP, MELCOR), as well as industry codes (such as RETRAN-3D, WGOTHIC, and NOTRUMP)

- identified shortcomings associated with several of these codes

- pointed out the inadequate and incomplete code documentation

- identified problems with the momentum equation and the applicability of several correlations used in the RETRAN-3D code promulgated by the Electric Power Research Institute (EPRI)

- questioned whether the code calculations are sufficiently independent of the noding for full-scale application

- recommended that the NRC staff should independently verify the validity of industry codes

- urged the staff to develop documents to guide the content of code submittals, and to establish procedures for use by the staff in reviewing the industry codes

The ACRS is in the process of reviewing several codes, including Siemens S-RELAP5, General Electric Nuclear Energy (GENE) TRACG, and the EPRI RETRAN-3D, as well as the Standard Review Plan Section and Regulatory Guide that will guide the content of code submittals and include procedures for use by the staff in reviewing industry codes.

Other Regulatory Activities

The ACRS plans to review (or continue reviewing) several other regulatory activities, including the extended burnup of reactor fuels, use of the Phenomena Identification and Ranking Table (PIRT) for high-burnup fuel, use of mixed-oxide (MOX) fuel in commercial light-water reactors, MOX fuel fabrication facility, and acceptance criteria for high-burnup fuels. The ACRS encouraged the NRC's participation in the experimental studies being performed at the CABRI reactor in France, and plans to follow up on those performed at the NSRR reactor in Japan. In addition, the ACRS will review reactor pressure vessel embrittlement issues, control room habitability, decommissioning activities, fire-protection issues including the NFPA-805 Standard, human factors, application for uranium enrichment facilities, safeguards, and transportation of radioactive materials.

Special Projects

The ACRS has performed an independent review of each major nuclear propulsion plant (NPP) design proposed by the Naval Reactors (NR) organization of the DOE and the U.S. Department of Defense (DOD). This review was initially requested by the NR organization, and was subsequently required by a Presidential Directive issued under Section 91b of the *Atomic Energy Act*.

The ACRS also reviewed the adequacy of the SEAWOLF submarine design in 1994, and will review the safety aspects of the proposed VIRGINIA class submarine during 2002. The ACRS has added significant value, as follows:

- The ACRS reviewed the safety aspects of the proposed NPP designs, and provided independent views on the adequacy of these designs. Since these designs are classified, they are not subject to public scrutiny. Consequently, the ACRS' independent evaluation of the adequacy of these designs provided credibility and aided the NR organization in justifying the technical adequacy of the designs in front of the U.S. Congress.

- The ACRS' comments and recommendations on the NR Training Program were very helpful to the NR organization in enhancing the effectiveness of this program.

- During its review of the Moored Training Ship Demonstration Project in 1987, the ACRS recommended that the NR organization apply a PRA methodology and severe accident analysis to the NPP design. Subsequently, the NR organization initiated the practice of performing a PRA, including severe accident analysis, for all succeeding NPP designs.

At the request of the Commission and the EDO, the ACRS has performed other special technical reviews:

- The ACRS, at the request of the EDO, reviewed a differing professional opinion (DPO) on steam generator tube integrity and provided recommendations to the EDO on resolution of the DPO.

- In response to a Commission request, the ACRS completed a technical review of issues related to spent fuel pool fires and provided recommendations for resolution of the issues.

Advanced Reactors

The Committee reviewed the GENE application for certification of its U.S. Version of the Advanced Boiling-Water Reactor (ABWR) standard design, the Asea Brown Boveri Combustion Engineering (ABB-CE) application for certification of the System 80+ standard design, and the Westinghouse AP600 design. These reviews were performed to fulfill the requirement of 10 CFR 52.53 that the ACRS report on those portions of the application that concern safety.

The Committee will continue to review the safety aspects of the proposed NPP designs, and will provide independent views on the technical adequacy of the designs. In addition, the ACRS will review the Westinghouse AP1000 standard plant design (if an application is submitted).

MEASURES OF SUCCESS

An assessment of the extent to which the goals and objectives of this plan have been achieved (including the ACRS' effectiveness, efficiency, quality, timeliness, and rate of success in contributing to the regulatory process) will be addressed in the annual ACRS Operating Plan.

ACRS ACTION PLAN UPDATE

The ACRS will periodically update this plan, as necessary. Revisions to the plan will be founded on ACRS' recognition of the need to update the plan, input from the Commission, changes to the NRC's Strategic Plan, changes in the direction of NRC programs, results from stakeholder surveys and self-assessments, external events and factors, and available resources.